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| EXAMINER | |
|---|---|
| AUSTIN, AARON | |
| **ART UNIT** | **PAPER NUMBER** |
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DATE MAILED: 12/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/759,112 | AFFELDT ET AL. | |
| | Examiner | Art Unit | |
| | Aaron S. Austin | 1775 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *13 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-29,31-46 and 48-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29,31-46 and 48-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Murphy (US Patent No. 5,716,720).

Murphy teaches a thermal barrier protected nickel based superalloy for use with gas turbine engine components including turbine blades (column 1, line 11). The platinum modified diffusion aluminide barrier is formed by depositing a layer of platinum on the substrate and chemical vapor depositing aluminum on the platinum covered substrate under high temperature and low activity conditions to form a diffusion zone (column 2, lines 45-51). The region of diffusion is a beta NiAl region (column 2, lines 24-27). The amount of aluminum used is about 18 to 26wt% and the amount of platinum is in the range of 8 to 35wt% (column 2, lines 32-36). Both "less than 18 wt%" and a value of 17.99 wt% overlap with "about 18" wt%.

Claims 1-3, 8-12, 16-18, 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Rose et al. (US Patent No. 5,482,578), Rose et al. (US Patent No. 5,492,726), or Rose et al. (US Patent No. 5,843,588).

The prior art references teach a coating and process for its application to substrates such as beta NiAl turbine blades (column 2, line 6 and column 4, line 15 of Rose '578). The coating is formed by application of a platinum group metal to the substrate, diffusion of the platinum layer to form a region of diffusion, subsequent application of aluminum, and diffusion of the aluminum into the platinum-substrate diffusion region (column 2, lines 15-32 of Rose '578). The aluminum is applied in a concentration of from 1 to 15wt% (column 3, line 49).

Claims 1-4, 8-13, 16-19, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Rickerby et al. (EP 0718419).

Rickerby et al. teach a coating for superalloy articles, such as nickel-based turbine blades (page 2, line 4 and page 4, line 26). The coating comprises a platinum aluminide surface layer (22) interdiffused with the substrate composition (see Fig. 2A). A region is formed at the substrate surface by the diffusion comprising platinum, aluminum, and components of the substrate (see Fig. 2A). The aluminum content of the layer (22) is at least 8wt% while the platinum content is at least 25wt% (page 3, lines 13-14), with each element present to a decreasing extent through the depth of the layer (page 7, line 24). The layer (22) is formed by application of an aluminum-containing layer over a platinum layer. Platinising diffusion heat treatment frees aluminum from the aluminum-containing layer that rapidly migrates toward the platinum and creates platinum aluminide in combination with substrate materials (page 7, lines 19-25). The platinum layer may be diffused into the substrate prior to the subsequent diffusion of the

aluminum-containing layer (page 7, lines 41-44). The platinum aluminide layer (22), or "P" phase layer, exhibits good stability and reduces migration of elements between layers applied to the substrate (page 10, line 16).

Claims 1-4, 8-13, and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Sangeeta (US Patent No. 6,395,406).

Sangeeta teaches an aluminum alloy-containing coating and method of its production for use with turbine engine components, such as turbine blades (column 2, lines 10-27 and column 6, lines 16-19). The coating is applied to a superalloy substrate such as a nickel-base alloys (column 5, lines 65-67). The coating is formed by mixing aluminum-containing slurry with at least one additional metal-containing slurry (column 3, lines 30-66). The first slurry contains from about 10 to about 70 wt% aluminum (column 3, lines 39-40). The second slurry may contain from about 20 to about 60 wt% platinum (column 4, lines 30-34) such that the final coating is a platinum aluminide (column 4, line 32). Following application to the substrate, the coating is subjected to diffusion heat treatment (column 7, lines 13-18) that inherently causes diffusion into the substrate. Thus a region is formed at the substrate surface by the diffusion comprising platinum, aluminum, and components of the substrate. The concentrations of aluminum and platinum will progressively decrease within the region due to the diffusion within the substrate to a point at which they are no longer present.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 18-24 and 52-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy (US Patent No. 5,716,720) in view of Sangeeta et al. (US Patent No. 6,485,780).

Murphy teaches a thermal barrier protected nickel based superalloy as described above.

Murphy does not specifically teach diffusion of aluminum subsequent to diffusion of platinum into the substrate.

Sangeeta et al. '780 teach diffusion of aluminum subsequent to diffusion of platinum into the substrate to form a platinum aluminide (column 7, lines 14-18; column 5, lines 55-58; column 3, lines 19-22). The diffusion process results in interdiffusion between aluminum, platinum, and the substrate (column 7, lines 63-65). Therefore, as Sangeeta et al. '780 clearly teach diffusion of aluminum subsequent to diffusion of platinum into the substrate provides the advantage of adjusting for the time and required to form various aluminides for varying thicknesses of the diffusion layer (column 5, lines 58-63), it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the coating taught by Murphy by diffusion of aluminum

subsequent to diffusion of platinum into the substrate as taught by Sangeeta et al. '780. Diffusion heat treatment inherently causes diffusion into the substrate such that the diffusion layer comprises platinum, aluminum, and components of the substrate. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 52-59, Murphy does not teach the aluminum content or platinum content as essentially constant in a zone comprising a specific percentage of a bounded region. As Murphy forms like materials in a like manner as claimed, it would therefore be expected that the diffusion coating will have the same characteristics claimed, particularly the aluminum content or platinum content will be essentially constant in a zone comprising a specific percentage of a bounded region overlapping that claimed, absence a showing of unexpected results. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada,* 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily posses the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Claims 25-29, 31-46, and 48-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy (US Patent No. 5,716,720) in view of Sangeeta et al. (US Patent No. 6,485,780).

Murphy does not teach the aluminum content or platinum content as essentially constant in a zone comprising a specific percentage of a bounded region.

As Murphy forms like materials in a like manner as claimed and described in the specification, it would therefore be expected that the diffusion coating will have the same characteristics claimed, particularly the aluminum content or platinum content will be essentially constant in a zone comprising a specific percentage of a bounded region as claimed, absence a showing of unexpected results. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada,* 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily posses the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Claims 4-7, 13-15, 19-21, 25-29, 31-46, and 48-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rose et al. (US Patent No. 5,482,578), Rose et al.

(US Patent No. 5,492,726), or Rose et al. (US Patent No. 5,843,588) in view of Murphy (US Patent No. 5,716,720).

The prior art references by Rose et al. teach a coating and process for its application as described above.

Rose et al. do not teach the percentage of platinum in the platinum group metal layer applied to the substrate. Further, Rose et al. do not teach the aluminum content or platinum content as essentially constant in a zone comprising a specific percentage of a bounded region.

Murphy teaches a platinum modified diffusion aluminide barrier wherein the amount of platinum is in the range of 8 to 35wt% (column 2, lines 32-36). Therefore, as Murphy clearly teaches a platinum-aluminum diffusion layer wherein the platinum content overlaps the claims provides the advantage of a diffusion barrier layer suitable for use in turbine engine components, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to apply the platinum layer taught by Rose et al. with a platinum content as taught by Murphy. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art. Further, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the platinum content for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 25-29, 31-46, and 48-59, as Rose et al. form like materials in a like manner as claimed and described in the specification, it would therefore be

expected that the diffusion coating will have the same characteristics claimed, particularly the aluminum content or platinum content will be essentially constant in a zone comprising a specific percentage of a bounded region as claimed, absence a showing of unexpected results. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada,* 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily posses the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Claims 5-7, 14-15, 20-21, 25-29, 31-46, and 48-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rickerby et al. (EP 0718419) in view of Rose et al. (US Patent No. 5,482,578), Rose et al. (US Patent No. 5,492,726), or Rose et al. (US Patent No. 5,843,588) in view of Murphy (US Patent No. 5,716,720).

Rickerby et al. teach a coating for superalloy articles as described above.

Rickerby et al. do not specifically teach the claimed percentage of platinum in the platinum group metal layer applied to the substrate nor do they teach the substrate as comprising more than 50% beta NiAl. Further, Rickerby et al. do not teach the aluminum content or platinum content as essentially constant in a zone comprising a specific percentage of a bounded region.

Rickerby et al. teach the content of platinum as at least 25wt% as cited above. The amount of platinum is substantially close to that of the instant claims such that one of ordinary skill would have expected compositions that are in such close proportions to those in prior art to be prima facie obvious, and to have same properties. *Titanium Metals Corp.*, 227 USPQ 773 (CA FC 1985). Further, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the platinum content for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Rose et al. teach a coating and process for its application to substrates such as beta NiAl turbine blades (column 2, line 6 and column 4, line 15 of Rose '578). Therefore, as Rose et al. clearly teach a substrate of beta NiAl provides the advantage of use under extreme temperatures as a turbine blade, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the turbine blade of Rickerby et al. with a substrate comprising beta NiAl. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 25-29, 31-46, and 48-59, as Rickerby et al. form like materials in a like manner as claimed and described in the specification, it would therefore be expected that the diffusion coating will have the same characteristics claimed, particularly the aluminum content or platinum content will be essentially constant in a zone comprising a specific percentage of a bounded region as claimed, absence a showing of unexpected results. It has been held that where the claimed and prior art

products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada,* 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily posses the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Claims 1-6, 8-17, 18-29, 31-40, 42-46, 48, and 50-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sangeeta (US Patent No. 6,395,406) in view of Sangeeta et al. (US Patent No. 6,485,780).

Sangeeta '406 teaches an aluminum alloy containing coating and method of its production for use with turbine engine components as described above.

Sangeeta '406 does not specifically teach diffusion of aluminum subsequent to diffusion of platinum into the substrate. However, application of a layer of platinum followed by diffusion treatment of aluminum is taught as a known method of forming a platinum aluminide layer (column 1, lines 26-35). Further, in the alternative to the argument above, Sangeeta '406 does not specifically teach diffusion heat treatment inherently causes diffusion into the substrate such that the diffusion layer comprises platinum, aluminum, and components of the substrate.

Sangeeta et al. '780 teach diffusion of aluminum subsequent to diffusion of platinum into the substrate to form a platinum aluminide (column 7, lines 14-18; column

5, lines 55-58; column 3, lines 19-22). The diffusion process results in interdiffusion between aluminum, platinum, and the substrate (column 7, lines 63-65). Therefore, as Sangeeta et al. '780 clearly teach diffusion of aluminum subsequent to diffusion of platinum into the substrate provides the advantage of adjusting for the time and required to form various aluminides for varying thicknesses of the diffusion layer (column 5, lines 58-63), it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the coating taught by Sangeeta '406 by diffusion of aluminum subsequent to diffusion of platinum into the substrate as taught by Sangeeta et al. '780. Diffusion heat treatment inherently causes diffusion into the substrate such that the diffusion layer comprises platinum, aluminum, and components of the substrate. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 5-6, 14-15, and 20-21, Sangeeta '406 teach the content of platinum as 20-60wt% as cited above. The amount of platinum is substantially close to that of the instant claims such that one of ordinary skill would have expected compositions that are in such close proportions to those in prior art to be prima facie obvious, and to have same properties. *Titanium Metals Corp.*, 227 USPQ 773 (CA FC 1985). Further, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the platinum content for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 25-29, 31-46, and 48-59, as Sangeeta '406, in view of Sangeeta et al. '780, form like materials in a like manner as claimed and described in the specification, it would therefore be expected that the diffusion coating will have the same characteristics claimed, particularly the aluminum content or platinum content will be essentially constant in a zone comprising a specific percentage of a bounded region as claimed, absence a showing of unexpected results. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada,* 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily posses the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Claims 7, 41, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sangeeta (US Patent No. 6,395,406) in view of Sangeeta et al. (US Patent No. 6,485,780), and further in view of in view of Rose et al. (US Patent No. 5,482,578), Rose et al. (US Patent No. 5,492,726), or Rose et al. (US Patent No. 5,843,588) in view of Murphy (US Patent No. 5,716,720).

Sangeeta '406, in view of Sangeeta '780, teaches an aluminum alloy containing coating and method of its production for use with turbine engine components as described above.

Sangeeta '406, in view of Sangeeta et al. '780, do not teach the substrate as comprising more than 50% beta NiAl.

Rose et al. teach a coating and process for its application to substrates such as beta NiAl turbine blades (column 2, line 6 and column 4, line 15 of Rose '578). Therefore, as Rose et al. clearly teach a substrate of beta NiAl provides the advantage of use under extreme temperatures as a turbine blade, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the turbine blade of Sangeeta '406, in view of Sangeeta et al. '780, with a substrate comprising beta NiAl.

Rose et al. do not teach the percentage of platinum in the platinum group metal layer applied to the substrate. Further, Rose et al. do not teach the aluminum content or platinum content as essentially constant in a zone comprising a specific percentage of a bounded region.

Murphy teaches a platinum modified diffusion aluminide barrier wherein the amount of platinum is in the range of 8 to 35wt% (column 2, lines 32-36). Therefore, as Murphy clearly teaches a platinum-aluminum diffusion layer wherein the platinum content overlaps the claims provides the advantage of a diffusion barrier layer suitable for use in turbine engine components, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to apply the platinum layer taught by

Rose et al. with a platinum content as taught by Murphy. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art. Further, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the platinum content for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Claims 1-29, 31-46, and 48-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,066,405 (Schaeffer), the cited prior art of record.

Schaeffer teaches a nickel-base superalloy substrate having an optimized platinum-aluminum diffused coating. The process of producing a diffused platinum-aluminum coating includes the steps of providing a nickel-base substrate (for example, a gas turbine component), depositing a platinum layer on the substrate, diffusing the platinum into the substrate, providing a source of aluminum, and diffusing the aluminum into the substrate. See Figure 3. Schaeffer states that the optimized platinum-aluminum diffusion coating contains at least 18 weight percent platinum and at least 18 weight percent aluminum, the balance of the coating composition being interdiffused components of the substrate (for example, nickel and chromium). Schaeffer teaches that the platinum, aluminum, and nickel concentrations in the coating region vary with the depth of the coating, and the specific compositions of surface regions are measured

by an integration method. See line 13 in column 4 to line 7 in column 6. Therefore, according to the teaching by Schaeffer regarding the measurement of specific compositions at various locations within a platinum-aluminum diffusion coating, it would be quite possible to optimize the coating process conditions for the purpose of obtaining particular platinum concentration profiles and aluminum concentration profiles at the surface of a substrate and within the platinum-aluminum diffusion coating. Also, the Examiner understands that applicants' claims require less than 18 weight percent of platinum and/or aluminum in the substrate surface region (for example, see claim 1), but the diffusion coating techniques utilized by Schaeffer will produce the same, lower platinum concentration and/or lower aluminum concentration within the diffusion coating being claimed by the applicants.

Schaeffer differs from the claims in that Schaeffer does not specify the particular platinum concentration profiles and aluminum concentration profiles that are possible at the surface of a substrate and within the platinum-aluminum diffusion coating.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have *optimized* the coating process conditions set forth by Schaeffer to such a degree or extent that particular platinum concentration profiles and particular aluminum concentration profiles are generated on a superalloy substrate when a platinum-aluminum diffusion coating is produced because Schaeffer provides sufficient information about the useful process techniques and process conditions which can be controlled in the production of a platinum-aluminum diffusion coating. A person skilled in the art of diffusion metal coating systems would have been motivated to rely

on Schaeffer because a result-effective variable (such as diffusion coating conditions and the amounts of platinum and aluminum in contact with a superalloy substrate) *can be optimized* by a skilled person in order to achieve a recognized result (such as particular platinum concentration profiles and particular aluminum concentration profiles at the substrate surface and in the platinum-aluminum diffusion coating). See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical.

Regarding claims 25-29, 31-46, and 48-59, as Schaeffer forms like materials in a like manner as claimed and described in the specification, it would therefore be expected that the diffusion coating will have the same characteristics claimed, particularly the aluminum content or platinum content will be essentially constant in a zone comprising a specific percentage of a bounded region as claimed, absence a showing of unexpected results. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada,* 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily posses the characteristics of the claimed products. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

***Response to Arguments***

Applicant's arguments, see the Remarks, filed September 13, 2006, with respect to the rejections of claims 11, 20, and 52-59 under 35 USC 112 have been fully considered and are persuasive. The rejections on these bases have been withdrawn.

Applicant's arguments filed September 13, 2006 have been fully considered but they are not persuasive.

In particular, Applicant argues Murphy does not teach the claimed aluminum content is a substrate surface region at the substrate surface. As acknowledged by Applicant, Murphy teaches a platinum modified diffusion barrier layer formed on the substrate having an inner diffusion zone, an intermediate layer, and an outer layer region. The intermediate region has an aluminum content of 18 to 26 wt%. The inner diffusion zone must have aluminum content less than the value in the intermediate layer as it diffuses into the substrate. This is due to the very nature of diffusion in which there is a reduced content by weight of the layer components in the form of a gradient as they diffuse into the substrate. Therefore, Murphy teaches the claimed amount of aluminum within the inner diffusion zone.

Applicant further argues that the presence of the alumina layer and ceramic thermal barrier layer over the diffusion layer is precluded by the claims. This argument is not commensurate with the claims. The term "comprising" is interpreted to indicate further layers may be applied over the claimed substrate surface region.

Further, Applicant argues with respect to the Rose reference that it does not necessarily follow that starting with an aluminum source powder which is present in an amount between 1 to 15 wt% will result in an integrated aluminum content in the substrate surface region which is less than 18 wt%. The Examiner respectfully disagrees as the very nature of diffusion is a reduced content by weight of the layer components in the form of a gradient as they diffuse into the substrate. Therefore, Rose teaches a region having the claimed amount of aluminum when diffused into the substrate.

Moreover, Applicant argues Rickerby et al. teach the presence of the alumina layer and ceramic thermal barrier layer over the diffusion layer and is therefore precluded by the claims. This argument is not commensurate with the claims. The term "comprising" is interpreted to indicate further layers may be applied over the claimed substrate surface region. Therefore, Rickerby does teach a component with the requisite platinum-aluminum substrate surface region at the substrate surface as outlined above.

Even further, Applicant argues Sangeeta fails to teach a component with a platinum aluminum substrate surface region wherein the integrated aluminum content is the substrate surface region is less than 18 wt%. The Examiner respectfully disagrees as the very nature of diffusion is a reduced content by weight of the layer components in the form of a gradient as they diffuse into the substrate. Therefore, Sangeeta teaches a

region having the claimed amount of aluminum when the slurry mix containing aluminum and platinum is diffused into the substrate.

Regarding the rejection over Murphy in view of Sangeeta, in addition to arguing Murphy does not teach the claimed composition as addressed above, Applicant further argues Sangeeta '780 does not indicate the amount of metals in the slurries they teach. However, Sangeeta '780 is not used in this rejection to teach the amounts slurry metals and instead is used to detail the obviousness of the order of diffusing platinum prior to aluminum.

Regarding claims 52-59 as rejected over Murphy in view of Sangeeta, Applicant argues the Examiner's conclusion that Murphy forms like materials in a like manner and it would therefore be expected that the diffusion coating will have the same characteristics claimed is based on a false premise, namely that the like materials are used in a like manner. However, Murphy in view of Sangeeta teaches all of the components and the method of their use in preparation of the claimed article as set forth above. Therefore, like materials are used in a like manner. Applicant has failed to show how the process of production is different such that the claimed zone is present in Applicant's claimed invention and not in the combination of Murphy and Sangeeta.

Regarding the rejection over the Rose references in view of Murphy, Applicant argues the layer structure of Murphy is precluded by the claims. However, Murphy is not used in this rejection to teach a layer structure and instead is used to detail the

obviousness of using the platinum taught by the Rose et al. references in the amounts claimed.

Regarding claims 25-29, 31-46, and 48-59, Applicant argues the Examiner's conclusion that Rose et al. form like materials in a like manner and it would therefore be expected that the diffusion coating will have the same characteristics claimed is based on a false premise, namely that the like materials are used in a like manner. However, Rose et al. in view of Murphy teach all of the components and the method of their use in preparation of the claimed article as set forth above. Therefore, like materials are used in a like manner. Applicant has failed to show how the process of production is different such that the claimed zone is present in Applicant's claimed invention and not in the combination of Rose et al. and Murphy.

Regarding the rejection over Rickerby in view of the Rose et al. references, and further in view of Murphy, Applicant argues Rickerby et al. teach the presence of the alumina layer and ceramic thermal barrier layer over the diffusion layer and is therefore precluded by the claims. This argument is not commensurate with the claims. The term "comprising" is interpreted to indicate further layers may be applied over the claimed substrate surface region. Therefore, Rickerby does teach a component with the requisite platinum-aluminum substrate surface region at the substrate surface as outlined above.

Regarding the rejection over Sangeeta '406 in view of Sangeeta '780, Applicant argues Sangeeta '406 teaches a slurry for application to a substrate but does not teach the subsequent composition of the resulting coating. The Examiner respectfully disagrees as the very nature of diffusion is a reduced content by weight of the layer components in the form of a gradient as they diffuse into the substrate. Therefore, Sangeeta teaches a region having the claimed amount of aluminum when the slurry mix containing aluminum and platinum is diffused into the substrate.

Applicant argues Schaeffer teaches away from the claimed ranges. Applicant provides a convincing argument, however the value of 17.99 wt% is substantially close to that of 18 wt% such that coatings containing each of the two values would be expected by one of ordinary skill in the art to act identically, absence a showing of unexpected results. In particular, the value of 18 wt% is substantially close to that of the instant claims such that one of ordinary skill would have expected compositions that are in such close proportions to those in prior art to be prima facie obvious, and to have same properties. *Titanium Metals Corp.*, 227 USPQ 773 (CA FC 1985). Further, as Applicant has noted in the specification and prior responses that "the industrial standard for the content of the platinum and aluminum includes a variance of +/- 10%" and that the language of "essentially constant" includes this variance (page 19 of the Response dated June 7, 2005). Thus one forming the claimed invention, by Applicants' own account, would expect a variation of at least +/- 10% which encompasses the differences between the claim and Schaeffer. This variation may or may not include batch production variances

and may or may not account for measurement variations that occur between samples, particularly when using more than one form of measurement. In short, the values are identical both in effectiveness and measurement. One of ordinary skill in the art would recognize this fact. The rejection based on obviousness is therefore maintained.

Applicant further argues Schaeffer does not teach a region of constant content of platinum or aluminum. "Schaeffer offers no teaching or suggestion as to how to achieve the constant content for any metal, as is required by the claims" (page 18 of the Response dated June 7, 2005). On the contrary, the method of formation taught by Schaeffer appears to be the same taught by Applicant: diffusion. Diffusion is a function of time and heat which effect the rate and extent of diffusion. As the specification does not appear to show any steps of formation outside of these factors, it must be assumed that the region of constant content is formed under the influence of time and heat alone. Applicant is requested to identify support that would indicate otherwise. Without such support, the products and method of production appear to be identical. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a *prima facie* case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. *In re Best*, 195 USPQ 430, 433 (CCPA 1977), *In re Spada,* 15 USPQ2d 1655, 1658 ( Fed. Cir. 1990). The *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily posses the characteristics of the claimed products. *In re*

*Best*, 195 USPQ 430, 433 (CCPA 1977). The rejection based on obviousness is therefore maintained.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASA

JENNIFER MCNEIL
SUPERVISORY PATENT EXAMINER
11/27/06